

# PATENT SPECIFICATION

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## (54) RELAXATION THERAPY APPARATUS

(71) I, HANS CARL LEUNER, of Eisenacher Straße 14, 34 Göttingen, Germany, a citizen of the Federal Republic of Germany, do hereby declare this invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an apparatus for use in relaxation therapy.

In treating psychical and psychosomatic illness, general nervousness, and states of exhaustion it is well known to provide for the patient ambulatory relaxation treatment. Applying a treatment of this type has been attempted by feeding electrical brain current into a stimulus generator by means of an apparatus for recording the electrical waveforms of the brain—known as an electro-encephalograph—which generator will amplify the weak current pulses to render them either audible or visible. These amplified current pulses can react on the central nervous system as a feedback and produce a relaxing effect. Such an apparatus using an electro-encephalograph cannot be used to advantage either in the doctor's surgery or in the privacy of the home, due to the generally prohibitive cost of an electro-encephalograph.

It is an object of the invention to provide an apparatus for use in relaxation therapy of simple construction and lower cost, such that its use can be extended beyond clinics and institutions.

According to this invention the apparatus comprises:—

i) a sensing device which in use senses a bodily function and provides an electrical signal corresponding in frequency and/or amplitude to the bodily function which is one of the following:— respiratory excursion motion; heart or pulse beat; muscle action; blood pressure;

ii) electronic control and transducing means; and

iii) a sensory stimulus generator adapted to stimulate the eye, ear or skin;

the said signal being passed to the control and transducing means which in use produces and passes a transduced signal substantially unaltered in respect of the form of the said frequency and/or amplitude to activate the stimulus generator.

The apparatus thus provides a feedback system which will react on the human body, without being of expensive construction. The cost of the apparatus of the invention may be sufficiently low that general practitioners and interested members of the public could afford it. The sensing device for sensing various bodily functions, which are of interest in the context of relaxation e.g. respiratory excursion of the chest or abdomen; heart and pulse beat; muscle action which provides tension or action current; and blood pressure, passes a corresponding electrical signal to the control and transducing means. It is possible to use for example an expansion measuring band of known construction as the sensing device for sensing respiratory excursion. For sensing heart beat and pulse there may be used a microphone or a plethysmograph. With respect to the muscles, it is possible to use a myograph, and for determining blood pressure, a blood pressure meter. The signal of the sensing device is passed in the frequency and/or the amplitude of the particular bodily function sensed, by way of the control and transducing means to the stimulus generator. The stimulus generator may be such that the intensity or the nature of the stimulus can be varied by the control means. It is possible to use a lamp or lamps, an acoustic signal generator, or an electrical pulse generator, to act as the stimulus generator. Variation in intensity of the stimulus may comprise for example attenuation with subsequent amplification or increase of for example the light, the acoustic signal, or electrical pulses. The variation in the nature of the stimulus may comprise for example modifying the wave length of the light or the sound frequency. The amplitude of the signal and the intensity of the stimulus at climax may be adjusted independently.

The feed-back system of the invention is based on the fact that synchronously with inhalation and exhalation, heart beat, the amplitude of muscle tension or of blood pressure of the patient, there is generated a surging or receding stimulus. This has the result that the human organism reacts in response to the sensory stimulus reaching the eye, ear or skin, which may be felt as disturbing or pleasant. This reaction occurs in the form of a modification of that bodily function from which a control signal has been derived, for instance from the breathing rhythm and/or from the amplitude of a sensed function. This produces, in turn, the result that the frequency or the amplitude of the sensory stimulus on the eye, ear or skin changes, and this change produces, in its turn, its effect on the functional system of inhalation, exhalation, heart frequency, muscle tension or blood pressure. In this way, a new equilibrium is gradually established, according to verification made after a few minutes, with respect to the frequency of breathing or the heart beat, the amplitude of the heart beat or muscle tension or blood pressure. This affects the psycho-vegetative nervous system of the organism represented in the central switching centres of the diencephalon and its peripheral executing organs. These types of "switching over" are characteristic of a functional change in the vegetative control of the whole organism as encountered during hypnosis, in deep or profound relation and in autogenous training.

The invention will now be described by way of example with reference to the accompanying drawing, the single Figure of which is a diagram showing the apparatus is use.

Referring to the drawing, an electrically resistive expansion measuring band 1 encircles the chest of a patient, and is electrically connected *via* a line 5 to an electronic control device 2. A line 6 couples the control device 2 to an electronic transducer 3 whence a further line 7 leads to the stimulus generator which is in the form of a lamp 4. Connections of the control device 2 and the transducer 3 to a mains supply are denoted by 8 and 9. The control device and the transducer together constitute an electronic control and transducing means.

#### WHAT I CLAIM IS:—

1. Apparatus for use in relaxation therapy comprising:—

i) a sensing device which in use senses a bodily function and provides an electrical signal corresponding in frequency and/or amplitude to the bodily function which is one of the following:— respiratory excursion motion; heart or pulse beat; muscle action; blood pressure;

ii) electronic control and transducing means; and

iii) a sensory stimulus generator adapted to stimulate the eye, ear or skin;

the said signal being passed to the control and transducing means which in use produces and passes a transduced signal substantially unaltered in respect of the form of the said frequency and/or amplitude to activate the stimulus generator.

2. Apparatus according to claim 1, wherein the sensing device includes an electrically resistive expansion measuring band.

3. Apparatus according to claim 1, wherein the sensing device is a microphone or a plethysmograph.

4. Apparatus according to claim 1, wherein the sensing device is a myograph.

5. Apparatus according to claim 1, wherein the sensing device is a blood pressure meter.

6. Apparatus according to any preceding claim, wherein the stimulus generator is adapted to vary the amplitude or frequency of the stimulus.

7. Apparatus according to any preceding claim, wherein the stimulus generator is a lamp or lamps.

8. Apparatus according to any of claims 1 to 6, wherein the stimulus generator is an acoustic signal producing device.

9. Apparatus according to any of claims 1 to 6, wherein the stimulus generator is an electrical pulse generating device.

10. Relaxation therapy apparatus constructed and arranged substantially as herein described and shown in the accompanying drawing.

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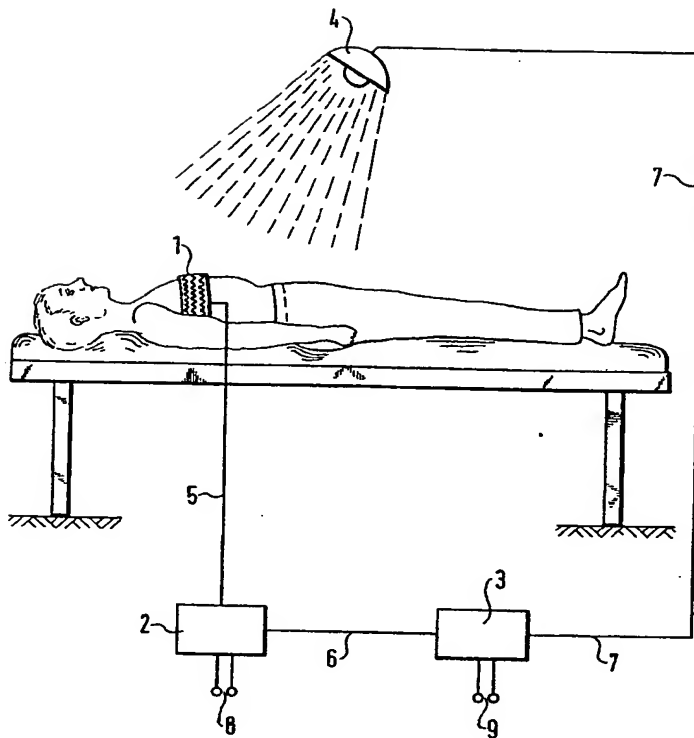
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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*



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